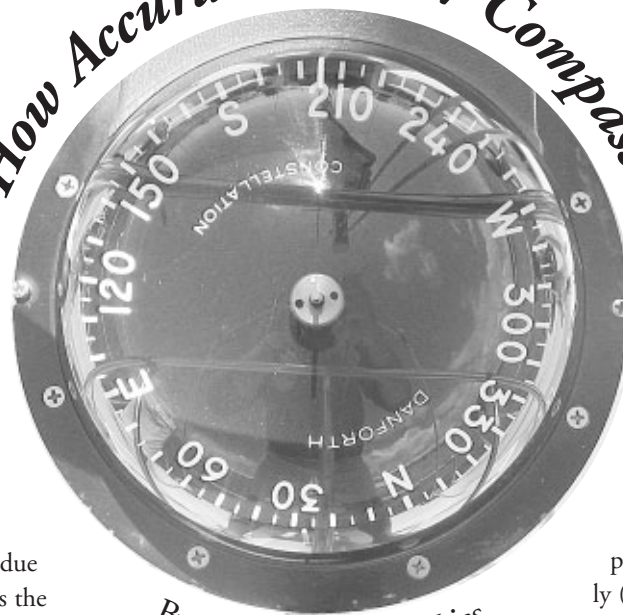


How Accurate Is Your Compass?



By Captain Bernie Weiss

How To Compensate Your Boat's Compass

If your boat is like most recreational craft, it has at least one magnetic compass. Your compass(es) should be checked periodically -- and corrected, if necessary -- for deviation due to adverse magnetic influences (such as the engine) aboard the boat. This process is called "compensating" the compass, or "adjusting" the compass. Failure to verify the compass accuracy, and/or failure to compensate or adjust for major deviation errors, could result in significant piloting mistakes.

Most quality marine compasses -- the Ritchie instruments come to mind -- have a built-in system of small correcting magnets which facilitates compensating for major deviation errors. This system consists of two sets of small magnets fixed to two adjusting rods with slotted ends. The entire arrangement is contained within the compass binnacle mount. On bracket and deck compass models, the black plastic inserts must be removed to gain access to the slotted compensator rod ends. The slots should be horizontal before starting the adjusting procedure.

Before starting compensation, check the area around the compass to make sure all material of a magnetic nature is secure and in its sea-going position. This might include, for example, your binnacle table or cup-holder, portable VHF radio, the GPS receiver, and even your binoculars.

Through the years, many sophisticated methods and devices have been used to compensate compasses, such as gyros, azimuth circles, sextants, and peloruses. However, I recommend the following sim-

ple and easy method. It is not only effective, all you need is a small non-magnetic screwdriver. A second method, also described below, explains how to compensate a compass using electronic equipment such as a GPS or Loran receiver. And there's a third method, too. More on this later.

I also recommend checking your compass for deviation at the start of each boating season, and every time you install new equipment in the vicinity of the compass. If you feel that the deviation on your boat is of an unusual nature, the services of a professional compass adjuster would be a wise investment.

Method 1 (easy technique any boater can apply)

1. With the compass in its intended position, but not finally secured, select two navigational aids that are in reasonably close proximity (+/- 1/4 mile) and within ten degrees of the north/south line. Two buoys will serve, if they are nearly north/south. But in the Stamford area, for example, there's an ideal place to do this -- Stamford Harbor, where there is a fixed range indicating the middle of the main harbor channel. This range is 010M.

2. From a position in the Harbor and mindful of traffic, run your boat visually along the northerly course, steering to keep the range markers lined up one behind the other. As you do this, turn the port/starboard compass compensator until the compass reads correctly (010M).

3. Reversing direction, run the boat southerly, again keeping the range marks lined up on the boat's axis. You should be steering 190M and the range should bear 010M. If the compass is not correct at this time, there is an alignment error. To correct, rotate the compass itself to remove one-half of this error. Repeat Steps 1 and 2 and then recheck this Step 3.

4. Repeat the procedures of Steps 1, 2 and 3, except this time, run the boat east and west across the range, and adjust the fore/aft compensator. When you cross the range steering 100M, the range should be abeam and should bear 010M. When you cross the range steering 280M, it should again bear 010M when abeam. Most times, any alignment error should have already been eliminated.

5. Upon completing the procedure, secure the compass in its final position.

Method 2 (also easy, but requires the use of GPS or Loran)

1. While at sea, with the compass in its intended position but not finally secured, obtain the Loran/GPS bearing to a single easily visualized and prominent navigational aid. In other words, position yourself a

mile or two directly south of a lighthouse such as the ones at Penfield Reef, Peck's Ledge, Greens' Ledge, or Stamford Light. Having selected your mark, enter its La and Lo coordinates (three decimal places) into your GPS or Loran as a waypoint.

2. Position your boat along that N-S line and steer your boat N -- directly at that mark. Turn the port/starboard compensator until the compass heading exactly matches the Loran/GPS bearing.

3. Check for a southerly error by steering directly away from the mark, that is, S. (On the GPS or Loran, the mark will still bear N.) The compass heading should be 180M. If any error is present, it is an alignment error. Rotate the compass itself to correct for one-half of this error. Repeat Steps 1 and 2 and then recheck this Step 3.

4. Repeat the procedures of Steps 1, 2 and 3 for the east/west course, using the fore/aft compensator, although, at this time, any alignment error should have been eliminated, and no alignment correction should be required. Of course, the mark should bear N when it is abeam.

5. Upon completing the procedure, secure the compass in its final position.

Method 3

Perhaps you have a second magnetic compass aboard; it may be a little hand-held "hockey puck," or an integral part of your binoculars. Or perhaps you have one of those trendy electronic digital compasses or a flux-gate compass.

Whatever -- dig it out, level it, and then stand with it behind your primary steering compass. Compare the readings (on at least the four cardinal points) with your primary steering compass. They should be much the same. Take the secondary compass forward to the bow and, with an assist from your crew, again compare readings of the two compasses. If the readings are not the same, you should consider evaluating and adjusting the pri-

mary compass as described in Methods 1 and 2 above.

Some other things to consider: When using your GPS or Loran to compensate a compass, always use the bearing "To or From" mode on the Loran/GPS. Do not use the heading information because in real time, the electronic heading may be highly variable due to the boat's motion; it is therefore unreliable for this purpose.

Also, to assure accuracy on all headings, expert mariners advise boaters to check for deviation every 30 or 45 degrees and to record deviation (if any) on a so-called deviation card. This card should be consulted when laying courses and piloting. However, in practical terms, if you have adjusted your compass at the cardinal points to correct the major magnetic deviation errors on your boat, and if your compass is accurate to within about 5 degrees, that will satisfy most requirements for recreational buoy-hopping in Long Island Sound. You won't get lost.

In my experience, steering a compass course with precise accuracy is almost impossible on a small boat anyway, and even the best helmsperson does well to maintain a margin of error of plus or minus 5 degrees. ♦

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